



# ASL100 Series of Two-in-one Sensor

Instructions V1.0

*Acrel Electric Co., Ltd.*



## Catalog

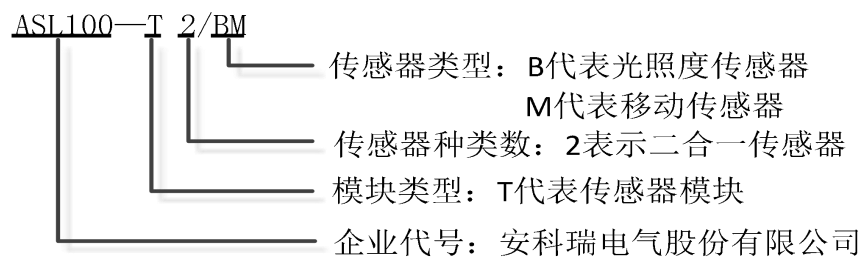
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## 1. Overview

ASL100-T2/BM two-in-one sensor (hereinafter referred to as sensor) is the illumination and human body movement two-in-one sensor based on Acrel-bus intelligent control system. The module is developed by Acrel and conforms to the rules of the enterprise standard Q31/0114000129C032-2017 *ASL100 Intelligent Lighting Control System*. European KNX communication bus is adopted and illumination is acquired in real time. When the illumination is more than and (or) less than the threshold of the parameter setting, the sensor will send the corresponding command according to the parameter setting. After the human body movement sensor detects the human activity, the sensor will send the corresponding control signal according to the parameter setting. In the intelligent control system, other control modules will match the sensor to achieve the intelligent control of illumination, fan and air conditioner. The module uses the latest single-chip microcomputer technology and is highly stable and reliable.

## 2. Specification and model

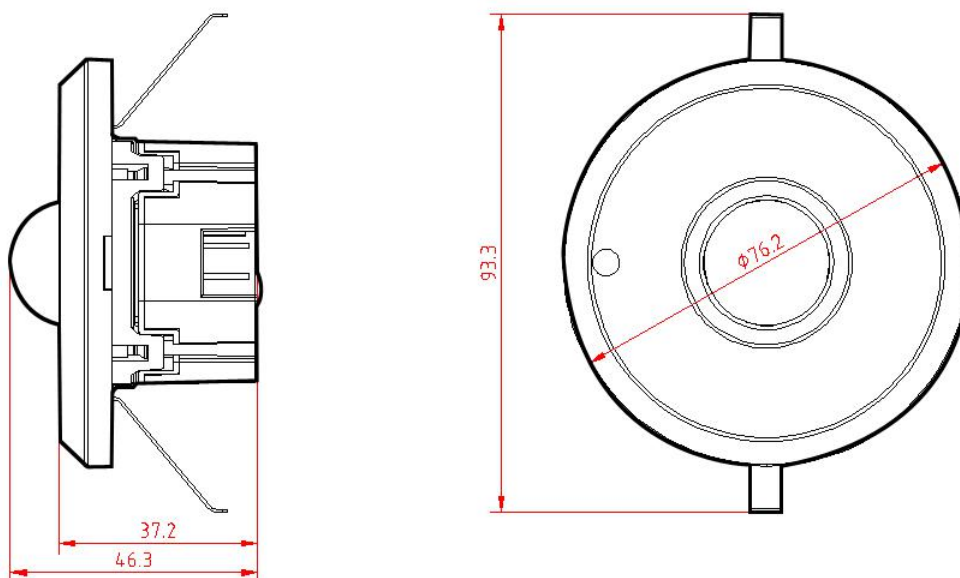


企业代号：安科瑞电气股份有限公司	Enterprise code: Acrel Electric Co., Ltd.
模块类型：T 代表传感器模块	Module type: T refers to sensor module
传感器种类数：2 代表二合一传感器	Sensor type number: 2 refers to two-in-one sensor
传感器类型	Sensor type
B 代表光照度传感器	B refers to illumination sensor
M 代表移动传感器	M refers to movement sensor

### 3. Technical parameters

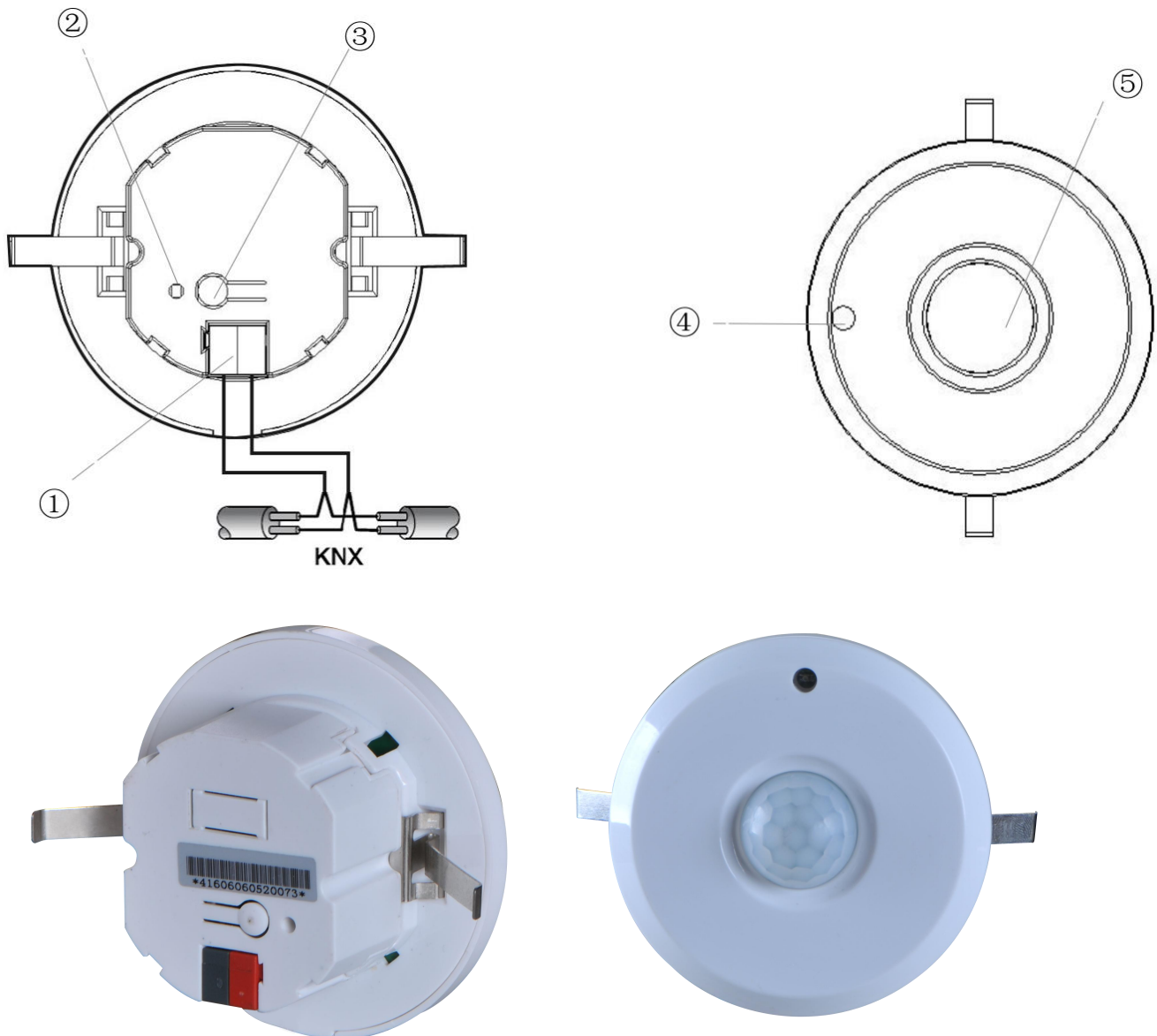
Power supply feature	KNX bus feeder	DC21~30V
	Power supply current	<12mA
	Power consumption	<360mW
External connection	KNX-TP1	Use twisted-pair cable conforming to KNX standard
	Wiring terminal at load end	Terminating with 0.5nm~0.6nm torque
Operation and display interface	Programming key and relevant indicator	LED indicator is in red when waiting for programming and is in green during and after programming.
Temperature range	Operating temperature	-5℃~+45℃
	Storage temperature	-25℃~+55℃
	Transport temperature	-30℃~+70℃
Environmental requirements	Maximum air humidity	95%
Mechanical parameters	Dimension (mm)	36x90x62
Installation	Embedded installation	

### 4. Configuration



**Installation notes:** the product is easy to install and is embedded. The installation hole size of the sensor is  $\varnothing 58\text{mm}$ . During installation, the product is fixed by the leaf springs on both sides. KNX bus is connected by the bus terminal and other modules.

## 5. Electric wiring diagram



- ① KNX bus terminal
- ② Running and programming indicator
- ③ Programming key
- ④ Illumination sensor
- ⑤ Human body movement sensor

## 6. Application guide

Two--in-one sensor includes illumination and human body movement. The sensor is connected into the system by KNX bus terminal without additional power supply. VD3.VD4 file is imported into ETS for sensor functional setting. The corresponding threshold and control command are set in the parameter window according to the actual need.

The functions of two-in-one sensor are shown below:

- Human body movement detection
- Illumination detection
- Three types of data output
- Illumination threshold setting
- Logic calculating function under conditions of illumination, movement and input, etc.
- Human body movement detection with 10 (1~10) levels of sensitivity

The illumination and human body movement two-in-one sensor module is generally used for entrances of aisle, garage and public place. When a human body moves, the light on the aisle is turned on, the relevant area light in the garage is turned on and the area lights in the public places are turned on. After the human body leaves, the lights in the relevant areas are turned off. The light is automatically controlled and lights in some areas are not turned on for a long time to avoid electrical energy waste. With the illumination and logic use, when the illumination is high in some areas and if there is the human movement, the light is not turned on to achieve energy saving and automation.

## 6.1 Product features

When detecting the human movement and (or) illumination is more or less than the threshold, the illumination and human movement two-in-one sensor has three formats of message control commands. The illumination and human body movement two-in-one sensor can control the on and off of the light, shutter and diming light with different settings. The sensor has 10 (1-10) levels of sensitivity for human body movement. There are different detection modes for different places. The logic function is to conduct the logic processing for the operation commands of illumination and human body movement to decide the driver action under two conditions.

## 6.2 Operating guide

### 6.2 Operating guide

1. Connect the module with the engineering network and connect the communication network with the computer attached with ETS by USB or IP gateway. Check whether the communication between the computer and network is normal.
2. Import VD3 file into ETS database and establish the relevant project. Add the dry contact module in the topological structure and set its physical address (the physical address cannot be repeated); later, open the parameter configuration page of the dry contact module and configure the corresponding parameters; finally, set the corresponding group address according to the actual needs.



- Click the download options in ETS, press the programming button of the dry contact module, and then download the parameter configuration information to the module. Finally, finish the application programming.

### 6.3 Parameter description

The module parameter is to set all parameters related to human body movement and illumination. The intelligent control of other driving modules is realized by illumination threshold, human body movement and logic setting.

#### 6.3.1 General

The parameters include the initialization time, sensor working mode, illumination, and human body movement and enabled functions of logic function. The specific parameters are shown below:

General	
System delay time after bus recovery	5s~30s,to stabilize the device
Sensor init time:[s]	5
Device type	Standard/Slave
Enable movement function	Enable
Enable brightness function	Enable
Enable logic function	Enable

#### **System delay time after bus recovery**

Options: 5s~30s to stabilize the device

#### **Sensor init time:[s]**

Options: 5...30

#### **Device type**

Options: Standard/Slave

Master

#### **Enable movement function**

Options: Enable

Disable



The parameter refers to the sensitivity changing the movement by the group object. If the parameter is selected as Enable, the corresponding group object is displayed in the group object. The sensitivity can be changed with ETS software. If Disable is selected, the sensitivity is the value set by the above parameter.

### **Movement delay time:[s]**

Options: 1...65535

The parameter sets the time of keeping current state after detecting the human body movement. For example, the parameter is set as 20 and after the human movement is detected, the light is turned on and then turned off after 20s (the parameter retrigger is selected as Enable, if the human body moves; it is turned on all the time). If the human body still moves, the light is turned on immediately.

### **Movement tel. cyclically send time:[s]**

Options: 1...65535

The parameter matches the first parameter in the movement function parameters. If the first parameter is set as Cyclically send, the parameter is the cycle time for sending message.

## **6.3.3 Movement Parameters**

The parameter block sets all parameters of movement detection, including value sending for all message types. The specific parameter window is shown below:

Movement Parameters	
Movement delay start, value send mode	Don't send
Movement delay start: 1bit[0..1]	0
Movement delay start: 4bit[0..15]	0
Movement delay start: 1byte[0..255]	0
Movement delay over, value send mode	Don't send
Movement delay over: 1bit[0..1]	0
Movement delay over: 4bit[0..15]	0
Movement delay over: 1byte[0..255]	0

### **Movement delay start, value send mode**

Options: Don't send

Send only once

Cyclically send

The parameter sets the mode of sending message after human body movement. The cycle sending time is set in the previous parameter window. However, the time of cycle sending message shall be within the delay time. Thus, the time of cycle sending message shall be controlled within the delay time.

#### **Movement delay start 1bit [0...1]**

Options: 0...1

#### **Movement delay start 4bit [0...15]**

Options: 0...15

#### **Movement delay start 1byte [0...255]**

Options: 0...255

#### **Movement delay over, value send mode**

Options: Don't send

Send only once

Cyclically send

The parameter sets the message sending mode after the human body movement is finished. The cycle sending time is set in the previous parameter window. However, the time of cycle sending message shall be within the delay time. Thus, the time of cycle sending message shall be controlled within the delay time.

#### **Movement delay over 1bit [0...1]**

Options: 0...1

#### **Movement delay over 4bit [0...15]**

Options: 0...15

#### **Movement delay over 1byte [0...255]**

Options: 0...255

### **6.3.4 Illumination Function**

The parameter sets the functions of illumination detection function, including illumination threshold, changing threshold by the group object, mode of acquiring current illumination. The specific parameters are shown below:

Brightness Function	
Brightness threshold 1(low)	0
Brightness threshold 2(high)	0
Brightness threshold change via bus	Disable
Illumination threshold hysteresis	Without hysteresis
Brightness update mode	Don't update
Brightness tel. cyclically send.(s)	15
Threshold 1 value must bigger than hysteresis value	<...Attention
Threshold 2 value must bigger than threshold 1 value	<...Attention
Lux="current brightness value"	<...Attention
Lower="brightness threshold 1"	<...Attention
Upper="brightness threshold 2"	<...Attention

**Brightness threshold 1(low)**

Options: 0...65535

**Brightness threshold 1(high)**

Options: 0...65535

**Brightness threshold change via bus**

Options: Enable  
Disable

**Illumination threshold hysteresis**

Options: Without hysteresis  
With hysteresis

**Brightness update mode**

Options: Don't update  
Update only after read  
Update cyclically

**Brightness update time:[s]**

Options: 1...65535  
Cycle time set of illumination value (if Brightness update mode is selected as Update cyclically)

### Brightness tel. cyclically send time:[s]

Options: 1...65535

Cycle time set of illumination value (match Brightness Parameters

Page value and mode selected as Cyclically send)

### Threshold 1 value must bigger than hysteresis value

Options: < ---Attention

### Threshold 2 value must bigger than threshold 1 value

Options: < ---Attention

### Lux= "current illumination value"

Options: < ---Attention

### Lower= "illumination threshold 1"

Options: < ---Attention

### Upper= "illumination threshold 2"

Options: < ---Attention

The five above parameter splines are used to remind all threshold setting and related auxiliary notes and tips.

## 6.3.5 Brightness Parameters

There are two options for the parameter block setting, including no delay and delay. All parameters of brightness detection are set in the page, including sending values for all message types. The specific parameters window without delay is shown below:

Brightness Parameters	
If lux<lower,value send mode	Don't send
lux<lower: 1bit[0..1]	0
lux<lower: 4bit[0..15]	0
lux<lower: 1byte[0..255]	0
If lower<=lux<=upper,value send mode	Don't send
lower<=lux<=upper: 1bit[0..1]	0
lower<=lux<=upper: 4bit[0..15]	0
lower<=lux<=upper: 1byte[0..255]	0
If lux>upper,value send mode	Don't send
lux>upper: 1bit[0..1]	0
lux>upper: 4bit[0..15]	0
lux>upper: 1byte[0..255]	0

If lux<lower, value send mode

**Options: Don't send**

Send only once

Cyclically send

The parameter sets the message sending mode after the brightness is detected to be less than the minimum threshold. The cycle sending time is set in the previous parameter window.

**lux<lower: 1bit [0...1]**

Options: 0...1

**lux<lower: 4bit [0...15]**

Options: 0...15

**lux<lower: 1byte [0...255]**

Options: 0...255

**If lower<=lux<=upper, value send mode**

Options: Don't send

Send only once

Cyclically send

The parameter sets the message sending mode after the brightness is detected to be within the set threshold. The cycle sending time is set in the previous parameter window.

**lower<=lux<=upper: 1bit [0...1]**

Options: 0...1

**lower<=lux<=upper: 4bit [0...15]**

Options: 0...15

**lower<=lux<=upper: 1byte [0...255]**

Options: 0...255

**If lux>upper, value send mode**

Options: Don't send

Send only once

Cyclically send

The parameter sets the message sending mode after the brightness is detected to be more than the maximum threshold. The cycle sending time is set in the previous parameter window.

**lux>upper: 1bit [0...1]**

Options: 0...1

**lux>upper: 4bit [0...15]**

Options: 0...15

**lux>upper: 1byte [0...255]**

Options: 0...255

The following window is the parameter setting window with delay:

Brightness Parameters	
If lux<lower,value send mode	Don't send
lux<lower: 1bit[0..1]	0
lux<lower: 4bit[0..15]	0
lux<lower: 1byte[0..255]	0
If lux>upper,value send mode	Don't send
lux>upper: 1bit[0..1]	0
lux>upper: 4bit[0..15]	0
lux>upper: 1byte[0..255]	0

#### If lux<lower, value send mode

Options: Don't send  
Send only once  
Cyclically send

The parameter sets the message sending mode after the brightness is less than the minimum threshold. The cycle sending time is set in the previous parameter window.

#### lux<lower: 1bit [0...1]

Options: 0...1

#### lux<lower: 4bit [0...15]

Options: 0...15

#### lux<lower: 1byte [0...255]

Options: 0...255

#### If lux>upper, value send mode

Options: Don't send  
Send only once  
Cyclically send

The parameter sets the message sending mode after the brightness is more than the maximum threshold. The cycle sending time is set in the previous parameter window.

#### lux>upper: 1bit [0...1]



Options: 0...1

**lux>upper: 4bit [0...15]**

Options: 0...15

**lux>upper: 1byte [0...255]**

Options: 0...255

### 6.3.6 Logic Function

The parameter block sets all parameters of logic function, including logic input enabled/disabled, logic function selection and time setting. The specific parameter window is shown below:

#### Logic input 0 is

Options: Enable  
Disable

#### Value of logic input 0 after bus recovery

Options: 0...1

#### Function between input 0 and the result of input 1/2

Options: AND  
OR  
XOR

#### Function between input 1 and input 2

Options: AND

OR

XOR

**Logic tel. cyclically send: [s]**

Options: 0...65535

**Input 1: :1 bit of illumination value**

Options: < --Attention

**Input 2: :1 bit of movement value**

Options: < --Attention

The parameter belongs to indicative parameter setting to prompt the functions of logics 1 and 2.

### 6.3.7 Logic Parameters

The parameter block sets all parameters of logic functions, including all sending value of all types of messages. The specific parameter window is shown below:

**If logic result='0', value send mode**

Options: Don't send

Send only once

Cyclically send

The parameter sets the message sending mode with 0 logic output. The cycle sending time is set in the previous parameter window.

**Logic result='0', 1bit [0...1]**

Options: 0...1

**Logic result='0', 4bit [0...15]**

Options: 0...15

**Logic result='0', 1byte [0...255]**

Options: 0...255

**If logic result='1', value send mode**

Options: Don't send

Send only once

Cyclically send

The parameter sets the message sending mode with 1 logic value. The cycle sending time is set in the previous parameter window.

**Logic result='0', 1bit [0...1]**

Options: 0...1

**Logic result='0', 4bit [0...15]**


Options: 0...15

**Logic result='0', 1byte [0...255]**

Options: 0...255

#### 6.4 Description of communication object

The communication object is the communication medium between the module on the bus and other control modules. The operation is realized by the address setting of the communication object. The sensor is the illumination and human body movement two-in-one sensor. All communication objects include the illumination and movement functions. The details are shown below:

 1 Enable movement function Enable movement function 1 比特 C - W - - 低级

No.	Function
1	Enable the movement detection function. The communication object is used to enable or disable the movement detection function.

2 Enable brightness function      Enable Brightness function      1 比特 C - W - - 1 bit DPT\_En... 低级

No.	Function
2	Enable brightness detection function. The communication object can enable or disable the brightness detection function.

3 Enable logic function      Enable logic function      1 比特 C - W - - 低级

No.	Function
3	Enable logic function. The communication object can enable or disable the logic function.

4 Slave value      Slave value      1 比特 C - W - - 低级

No.	Function
4	The group object is used to receive the value sent from the sensor. If the value is the value designed by parameter "Master delay start when", the main sensor sends the value and begins the delay. If it is not the designed value, the main sensor ignores it.

5 Master send 1 bit[0..1]      Master send 1 bit      1 比特 C - - T - 1 bit DPT\_Sw... 低级

No.	Function
5	When the main sensor receives the designed value or delay completion from the sensor, the main sensor sends 1bit message.

6 Master send 4 bit[0..15]      Master send 4 bit      4 比特 C - - T - 3 bit controll... 低级

No.	Function
6	When the main sensor receives the designed value or delay completion from the sensor, the main sensor sends 4bit message.

7 Master send 1 byte[0..255]      Master send 1 byte      1 字节 C - - T - 8 bit unsign... 低级

No.	Function
7	When the main sensor receives the designed value or delay completion from the sensor, the main sensor sends 1byte message.

8 Movement send 1 bit[0..1]      Movement send 1 bit      1 比特 C - - T - 1 bit DPT\_Sw... 低级

No.	Function
8	The sensor detects the object movement sending 1bit message.

9 Movement send 4 bit[0..15]      Movement send 4 bit      4 比特 C - - T - 3 bit controll... 低级

No.	Function
9	The sensor detects the object movement sending 4bit message.

10 Movement send 1 byte[0..255] Movement send 1 byte 1 字节 C - - T - 8 bit unsign... 低级

No.	Function
10	The sensor detects the object movement sending 1byte message.

11 Brightness send 1 bit[0..1] Brightness send 1 bit 1 比特 C - - T - 1 bit DPT\_Sw... 低级

No.	Function
11	The sensor detects the brightness sending 1bit message.

12 Brightness send 4 bit[0..15] Brightness send 4 bit 4 比特 C - - T - 3 bit controll... 低级

No.	Function
12	The sensor detects the brightness sending 4bit message.

13 Brightness send 1 byte[0..255] Brightness send 1 byte 1 字节 C - - T - 8 bit unsign... 低级

No.	Function
13	The sensor detects the brightness sending 1byte message.

14 Change brightness threshold 1 Change lower threshold 2 字节 C - W - - 低级

No.	Function
14	The group object is to change the brightness threshold 1.

15 Change brightness threshold 2 Change upper threshold 2 字节 C - W - - 低级

No.	Function
15	The group object is to change the brightness threshold 2.

16 Read lux value Read lux value 2 字节 C R - T - 低级

No.	Function
16	The group object is used to read the current brightness.

17 Cyclically send lux value Cyclically send lux value 2 字节 C - - T - 低级

No.	Function
17	The group object is used to cyclically send current brightness value.

18 Logic input 0 value Logic input 0 value 1 比特 C - W - - 低级

No.	Function
18	The group object is used for logic input.

19 Logic send 1 bit[0..1] Logic send 1 bit 1 比特 C - - T - 1 bit DPT\_Sw... 低级

No.	Function
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19	The group object is used to logically output 1bit data.
20	Logic send 4 bit[0..15]      Logic send 4 bit      4 比特 C - - T - 3 bit controll... 低级
No.	Function
20	The group object is used to logically output 4bit data.
21	Logic send 1 byte[0..255]      Logic send 1 byte      1 字节 C - - T - 8 bit unsign... 低级
No.	Function
21	The group object is used to logically output 1byte data.
22	Movement sensitivity change      Movement sensitivity change      1 字节 C - W - - 低级
No.	Function
22	The group object is used to change the sensitivity of movement detection.

## 7. Notes

1. Check whether its appearance is damaged before using the module. In case of damage, please ask the retailer to replace it to prevent electric leakage during use and avoid personal injury.
2. Install the module with the power failure. If the module cannot be replaced with the power failure, please ask the professional personnel to conduct the operation according to the situation.
3. Connect the module with the bus before debugging. Check whether its running indicator is normal. Operate the programming button and check whether the programming indicator works normally. If the indicator works abnormally, please contact the relevant staffs. Operate the programming button and observe whether the programming indicator works normally.
4. Confirm whether the bus and computer are connected correctly before downloading the parameter.
5. Select the standard EIB twisted-pair cable as the communication cable and use the standard KNX wiring terminal.